

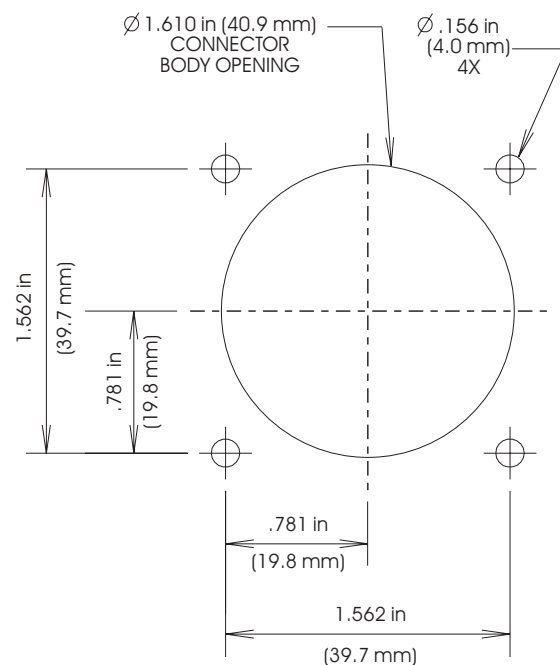
KMA 950-SXXI HEAD EXTENSION CABLE FIELD INSTALLATION PROCEDURE



CAUTION: System components are highly sensitive to electrostatic charges. Equipment damage may result from improper handling. ESD static protection practices must be followed when handling any component of this system.

This procedure contains complete instructions for the field installation of a KMA 950-SXXI injector head extension cable. Also included is a complete verification procedure that applies only to Mark V *Plus* units identified with an E suffix on the Serial Number Tag. Use of the verification procedure with any other type of unit or injector head may result in erroneous readings. All wires, with the exception of pins 24, 25, and 26, are tested. The completion of this installation and checkout procedure assures the proper installation of the KMA 950-SXXI.

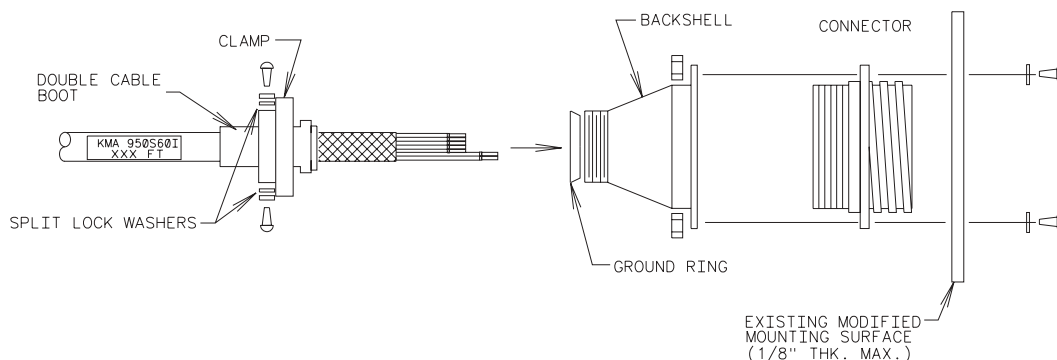
Figure 1



Installation Procedure:

1. (*Bulkhead Mount Connector only*) Select a suitable mounting surface on which to secure the bulkhead mounted connector. Referring to Figure 1, (which can be used as a template if desired) mark the mounting surface locations for the connector body opening and four mounting holes. Drill the appropriate holes as required. Ensure that all burrs and sharp edges are removed.
2. Slide the clamp, lockwashers, ground ring, and backshell into position on the cable. The cable boots will already be installed on the cable. The clamp must be positioned on the outside of the cable boots. See Figure 2.

Figure 2

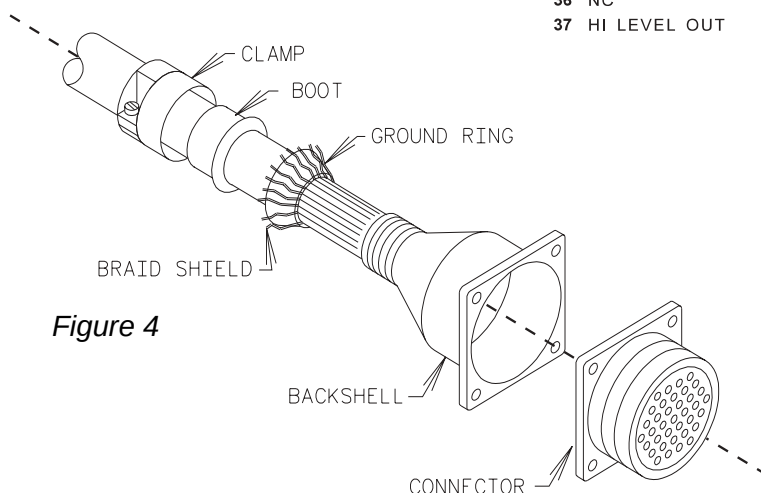


3. Orient the cable wires and connectors and install into the connector, referring to Figure 3. Ensure that the sockets are securely locked into the connector housing.

NOTE: National Cables have a dark grey cable jacket, Alpha and Pope Cables have either a light grey or off-white cable jacket.

4. (Bulkhead Mount Connector only) Secure the backshell and connector to the mounting surface with the hardware provided. See Figure 2.

5. Fold back the braid shield over the ground ring as shown in Figure 4. Trim the braid shield if necessary.



6. Loosen the clamp screws, slide the cable boots to the ground ring, and screw the clamp into the backshell, ensuring that the braid shield is in contact with the ground ring and backshell.
7. Tighten the clamp screws until secure. Do not overtighten.

Figure 3

SIGNAL		ALPHA or POPE CABLE COLORS	NATIONAL CABLE COLORS
1	MOTOR +	WHT/GRN/BLK	1 WHT/BLK/GRN
2	AC GND	WHT/RED/VIO	2 WHT/BLK/YEL & WHT/BLK/ORG
3	AC GND	WHT/RED/BRN	3 WHT/RED & WHT/BLK/RED
4	MOTOR -	WHT/RED/BLU	4 WHT/BLK/BRN
5	MOTOR	WHT/ORG	5 WHT/YEL
6	AC GND	WHT/YEL	6 WHT/ORG & BLU
7	+15 V	WHT/RED	7 WHT/BRN
8	-15 V	WHT/BLK	8 WHT/BLK
9	MOTOR -	WHT/RED/GRN	9 WHT/RED/GRN
10	+5 V	WHT/GRY	10 WHT/BLK/BLU
11	AC GND	WHT/BRN	11 BLK & BRN
12	NC	WHT/BLU	12 NC
13	SPARE	WHT/GRN	13 GRN
14	EXTV GND	WHT	14 WHT
15	+26 V	WHT/RED/RED	15 WHT/YEL/RED & GRY
16	M.S. MOTOR +	WHT/VIO	16 WHT/BLK/VIO
17	60/200 ML DR	VIO	17 WHT/GRN
18	60 ML	ORG	18 RED
19	DIG. GND	GRN	19 ORG
20	REV	RED	20 YEL
21	NC	RED/BLK	21 NC
22	HEATER GND	WHT/RED/BLK	22 WHT/RED/ORG
23	M.S. MOTOR -	WHT/BLK/RED	23 WHT/BLK/GRY
24	ARM LT. DR	BLU	24 WHT/BLU
25	150 ML DR	BLK	25 WHT/VIO
26	TUR LIM SWITCH	YEL	26 WHT/GRY
27	FWD	RED/YEL	27 VIO
28	NC	NC	28 NC
29	+10 V REF	GRY	29 WHT/BRN/RED
30	PLNG POS	BRN	30 WHT/BRN/YEL
31	MS POS	TAN	31 WHT/BRN/GRN
32	POT LOW	RED/GRN	32 WHT/BRN/VIO
33	CALIB. / OPER.	WHT/BLK/VIO	33 WHT/BRN/GRY
34	STATUS	PINK	34 WHT/BRN/ORG
35	NC	NC	35 NC
36	NC	NC	36 NC
37	HI LEVEL OUT	WHT/BLK/GRY	37 WHT/BRN/BLU

Verification Procedure:

1. Ensure that the injector head plunger is fully retracted, and that the mechanical stop is in the standby position.
2. Remove power from the injection system.
3. Connect the male end of the injector head extension cable to J21 on the rear connector panel. Do not attach the female end to the injector head cable. Secure the end of the cable in a way that will allow both of your hands free to perform the following measurements.
4. Set the voltage meter to the resistance scale, and verify that pins 19 and 22 are shorted together (less than 3 ohms).
5. Set the voltage meter to the voltage scale. Apply power to the injection system, and place the meter leads as designated in *Table 1*. Ensure that the values are as shown, and check off each line as it is tested.
6. Remove power from the injection system. Set the voltage meter to the resistance scale. Place the leads in the positions as shown in *Table 2*, and ensure that the values are correct. Check off each line as it is tested. An open pin location is the same as an open meter reading.
7. This completes the test from the female end of the extension cable. Connect the extension cable to the injector head cable.
8. Disconnect the head extension cable from the J21 connector at the rear connector panel. Secure the end of the cable in a way that will allow both of your hands free to perform the following measurements.

TABLE 1

RED LEAD	BLACK LEAD	METER READING	CK ✓
PIN 7	PIN 19	+15V +/- .6V	
PIN 8	PIN 19	-15V +/- .6V	
PIN 10	PIN 19	+5V +/- .1V	
PIN 15	PIN 19	+24V +/- 3V	
PIN 16	PIN 19	-670mV +/- 100mV	
PIN 23	PIN 19	-26V +/- 2.6V	
PIN 18	PIN 19	+5V +/- .1V	
PIN 29	PIN 19	+10V +/- .2V	
PIN 30	PIN 19	+12.3V +/- .25V	

TABLE 2

RED LEAD	BLACK LEAD	METER READING	CK ✓
CONN. SHELL	PIN 2	SHORT	
PIN 3	PIN 2	SHORT	
PIN 6	PIN 2	SHORT	
PIN 11	PIN 2	SHORT	
PIN 14	PIN 2	OPEN	
PIN 19	PIN 2	OPEN	
PIN 28	PIN 2	OPEN	
PIN 33	PIN 2	OPEN	
PIN 34	PIN 2	OPEN	
PIN 35	PIN 2	OPEN	
PIN 36	PIN 2	OPEN	
PIN 37	PIN 2	OPEN	
PIN 14	PIN 19	OPEN	
PIN 28	PIN 19	OPEN	
PIN 33	PIN 19	OPEN	
PIN 34	PIN 19	OPEN	
PIN 35	PIN 19	OPEN	
PIN 37	PIN 19	OPEN	
PIN 18	PIN 19	3K +/- 0.5K	
PIN 1	PIN 19	100 Ω +/- 10	
PIN 5	PIN 19	100 Ω +/- 10	
PIN 4	PIN 9	SHORT	

9. Set the voltage meter to the resistance scale. Place the leads in the positions shown in *Table 3*. Ensure that the values are as listed, and check off each line as it is tested.
10. The testing sequence is now complete. Connect the head extension cable at J21 on the rear connector panel.
11. Perform an installation checkout procedure as found in the Mark V *Plus* Operation Manual to verify complete and proper operation of the injection system.

TABLE 3

RED LEAD	BLACK LEAD	METER READING	CK ✓
CONN. SHELL	PIN 2	SHORT	
PIN 3	PIN 2	SHORT	
PIN 6	PIN 2	SHORT	
PIN 11	PIN 2	SHORT	
PIN 12	PIN 2	OPEN	
PIN 13	PIN 2	OPEN	
PIN 14	PIN 2	OPEN	
PIN 21	PIN 2	OPEN	
PIN 28	PIN 2	OPEN	
PIN 33	PIN 2	OPEN	
PIN 34	PIN 2	OPEN	
PIN 35	PIN 2	OPEN	
PIN 36	PIN 2	OPEN	
PIN 37	PIN 2	OPEN	
PIN 2	PIN 19	OPEN	
PIN 12	PIN 19	OPEN	
PIN 13	PIN 19	OPEN	
PIN 14	PIN 19	OPEN	
PIN 21	PIN 19	OPEN	
PIN 28	PIN 19	OPEN	
PIN 33	PIN 19	OPEN	
PIN 34	PIN 19	OPEN	
PIN 35	PIN 19	OPEN	
PIN 36	PIN 19	OPEN	
PIN 37	PIN 19	OPEN	
PIN 1	PIN 5	SHORT	
PIN 4	PIN 9	SHORT	
PIN 17	PIN 19	7.5K +/- 1K	
★ PIN 17	★ PIN 19	★ 5K +/- 1K	
PIN 20	PIN 19	1.5M +/- .5M	
PIN 27	PIN 19	1.5M +/- .5M	
PIN 16	PIN 23	30 Ω +/- 15	
PIN 29	PIN 32	4.7K +/- 1K	
PIN 30	PIN 32	250 Ω +/- 50	
PIN 31	PIN 32	4.9K +/- .5K	

★ The Pin 17/19 meter reading is 7.5K +/- 1K for all injector heads except for 150/200 Mark V heads. The Pin 17/19 reading for 150/200 injector heads is 5K +/- 1K.